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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,507	10/23/2003	Ji Yong Park	1514.1032	6043

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EXAMINER

SONG, MATTHEW J

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/690,507

Applicant(s)

PARK ET AL.

Examiner

Matthew J. Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 4,5,11-12 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-10, 13-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/16/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Withdrawn Rejections***

1. Applicant's arguments, see page 6 of the remarks, filed 8/11/2006, with respect to rejection in view of Yang ('759) have been fully considered and are persuasive. The rejection of claims 1-3, 6-10 and 13-14 has been withdrawn.

2. Applicant's arguments, see page 7 of the remarks, filed 8/11/2006, with respect to rejection in view of Jung ('341) have been fully considered and are persuasive. The rejection of claims 1-13 and 13 has been withdrawn.

### ***Information Disclosure Statement***

3. The information disclosure statement filed 10/16/2006 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the AM reference, Office Action issued in Korean Patent Application No 2003-12101 on December 16, 2004, is not in English and there is no explanation of the relevance or an English Abstract. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 2 and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 2 recites, "an average width of the polycrystalline silicon grains is at least 2  $\mu\text{m}$ " in lines 2-3. There is no support for this limitation in the original disclosure. The original disclosure merely teaches polycrystalline grains having with of at most 0.7  $\mu\text{m}$  in Figure 3 and average widths greater than 0.2  $\mu\text{m}$  or more in paragraph [0032] of page 6 of the specification, likewise for claim 9

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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7. Claims 1-3 and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Jung (US 6,825,493).

Jung discloses a method of forming an amorphous silicon layer on a substrate and crystallizing the amorphous layer to form polycrystalline silicon (col 14, ln 35-67). Jung also discloses the crystallization method comprises irradiating the amorphous silicon layer **200** with a laser beam **34** that passes through a mask **130** (col 9, ln 1-67 and Fig 6a). The mask is then moved along the lateral grain growth of the grains by a distances of about 0.7 micrometers; therefore each of the light transmitting portions of the mask exposes a portion of the first grain region, middle section, the second grain regain and an new amorphous silicon regions are additionally exposed resulting in larger grains (col 9, ln 45-67), this reads on applicant's the laser beam is overlappingly irradiated at an overlapping region on the substrate where amorphous silicon and a part of the already crystallized polysilicon are exposed so as to increase an average width of the polycrystalline silicon grains. Jung also teaches the width of the overlap corresponds to movement of the mask, which is varied between 0.7 micrometers and 1.7 micrometers (col 9, ln 45-67; col 10, ln 25-45; and col 14, ln 1-25).

Referring to claim 2, Jung teaches silicon grains have a width of 12 micrometers (col 10, ln 1-15) and have a grain width of 1.7 micrometers when the overlap is decreased (col 10, ln 1-65).

Referring to claim 3, Jung teaches sequential lateral solidification crystallization (Abstract).

Referring to claim 13-14, Jung discloses irradiating an amorphous silicon film using a laser beam through a mask with a light transmission region and a light non-transmission region;

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transversely moving the mask; overlappingly irradiating the already formed crystalline silicon and has a width of 0.7  $\mu\text{m}$  to 1.7  $\mu\text{m}$  (col 9, ln 1 to col 10, ln 65).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung (US 6,825,493) as applied to claims 1-3 and 13-14 above, and further in view of Yang (US 2002/0197759 A1).

Jung discloses all of the limitations of claim 6, as discussed previously, except Jung does not teach the laser transmission region is wider than the laser non-transmission region by more than 1  $\mu\text{m}$ .

In a method of sequential laser solidification (SLS) for crystallization of amorphous silicon, note entire reference, Yang teaches the mask moves transversely by no more than the wide of the shaped patterns as a laser performs SLS crystallization. (Abstract). Yang also teaches a mask includes a plurality of slits A that pass a laser beam and a light absorptive areas B that absorb the laser beam and the wide of each slit A defines the grain size of the crystallized silicon ([0010]). Yang also teaches using a pattern of 2  $\mu\text{m}$  ([0072]) and grains of 1-1.5  $\mu\text{m}$  ([0076]). Yang also teaches an overlapped regions ([0040]). Yang also teaches more rapid crystallization can be achieved using masks having different slit patterns and laser beam scanning ([0035]). Yang also teaches a pattern where the slit patterns are wider than an interval "O". (Fig 6 and [0035]).

Yang teaches using different patterns and a pattern where the laser transmission region is larger than a non-transmission regions. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Jung by having a transmission region that is wider than a non-transmission region by more an 1  $\mu\text{m}$  by optimizing the mask size because the size of the slit is a result effective and different patterns are used to achieve more rapid crystallization, as taught by Yang.

Referring to claim 7, the combination of Jung and Yang teaches stripes ('493 Fig 5 and '759 Fig 6).

Referring to claims 8-10, the limitations are the same as claims 1-3 which was discussed previously.

### ***Response to Arguments***

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10. Applicant's arguments with respect to claims 1-3, 6-10 and 13-14 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

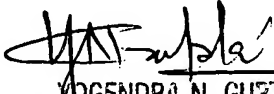
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
YOGENDRA N. GUPTA  
SUPERVISORY PATENT EXAMINER  
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Matthew J Song  
Examiner  
Art Unit 1722

MJS

October 27, 2006